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THE HIGH COST OF CAPITAL

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BEFORE THE

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CONGRESS OF THE UNITED STATES

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THE HIGH COST OF CAPITAL

THURSDAY, APRIL 28, 1983

CONGRESS OF THE UNITED STATES,
JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The committee met, pursuant to notice, at 9:50 a.m., in room 2203, Rayburn House Office Building, Hon. Edward M. Kennedy (member of the committee) presiding.

Present: Senators Bentsen and Kennedy; and Representatives Scheuer and Wylie.

Also present: Charles H. Bradford, assistant director; and Mark R. Policinski and David A. Smith, professional staff members.

OPENING STATEMENT OF SENATOR KENNEDY, PRESIDING

Senator KENNEDY. This committee has had a strong tradition of bipartisanship, and over its history has had the opportunity to provide guidance to the Congress and the various committees on economic questions. And in so doing, it has had the benefit of counsel from men and women who, through practical experience and with the advantage of time and testing, have suggested and recommended different ideas to us—practical alternatives which can strengthen our economy and improve our competitive position not only within the United States but within the world.

This morning we're extremely fortunate to have Mr. George Hatsopoulos here to make a presentation on one of the very important aspects of economic policy, and that is capital formation, and the cost of capital. Mr. Hatsopoulos has explored the implications of these costs, not only in terms of our own economic situation here at home but also in the relationship of the United States and our firms to the world.

I think this is enormously important. We've read this morning an editorial, talking about various recommendations on economic matters that are being considered even within this administration. The issue of capital formation is debated and discussed on the floor of the Congress, the Senate, and the respective tax committees. Nothing is more important than that we understand the process in question, before we enact new measures.

George Hatsopoulos is a real Horatio Alger story in this country. Most importantly, he is a good citizen, which is what has brought him here and has involved him in a number of causes in our own State. He is available to help people in need to help the community,

and to help the small businessmen and women get started and share his own expertise.

George, I want to welcome you very much to this committee. I will not be able to remain during the course of all of your testimony. Congressman Wylie will chair the hearings. But, fortunately, I have had the opportunity to spend time with you on this proposal, and for me, it is always worthwhile to hear it again, and again, and again, as it is a very important statement and one which is extremely important for this committee to hear and learn more about.

I also want to welcome Jack Albertine, who is no stranger to this committee, and has worked with all of us for a long period of time. We have all benefited from his own experience. Thank you.

Congressman Wylie.

OPENING STATEMENT OF REPRESENTATIVE WYLIE

Representative WYLIE. Thank you very much, Senator Kennedy. I am pleased to be here to welcome your famous citizen from Massachusetts, Mr. Hatsopoulos, to the deliberations of the Joint Economic Committee this morning.

I'm sorry there aren't more of us here, but there are a lot of things going on today. It seems to be an extremely busy day for the House as well as on the floor of the Senate.

But just in a brief opening statement, from my vantage point, a great deal of stock has been placed recently in the hope that high technology will spring up in the United States and provide jobs to replace those we fear may never be regained in the heavy manufacturing industries. As a matter of fact, we have a high-tech industrial complex in my own district.

In the Congress, we have been concerned with providing help to retrain workers for these new technological jobs, and we have rushed to correct deficiencies in our math and science curricula that leave many of our students ill-prepared for the demands of today's job market.

Unfortunately, wishful thinking and preparation of the labor force will not be enough to make these new job opportunities come to life. I fear there must also be a tremendous level of capital investment at high risk and over a long period of time.

It seems to me that one of the primary factors in whether this investment will take place is the cost of capital, with which we will take your testimony this morning.

During the 1970's, gross fixed investments consumed about 18 percent of the U.S. gross national product. But two-thirds of this investment simply replaced wornout technical equipment, leaving just about 6 or 7 percent of GNP as our commitment to new capital creation. Manufacturing productivity gains, which are essential to a rising standard of living for workers, has inched ahead just 2.6 percent annually.

Growing awareness of this problem, initially stimulated in Congress by the work of this committee, led President Reagan to propose, and the Congress to enact, changes in the tax laws designed to lower the high cost of capital in order to increase investment.

But have we been successful?

And you will address that, I know.

Is the cost of capital significantly lower than the prohibitively high level which existed before the economic recovery program was enacted in 1981?

This is the question which we will ask our distinguished witness this morning, Mr. George Hatsopoulos. I think the answer to this is very critical.

Thank you very much, Senator Kennedy.

Mr. Hatsopoulos, we'll ask you to proceed in your own way.

STATEMENT OF GEORGE N. HATSOPOULOS, FOUNDING MEMBER, AMERICAN BUSINESS CONFERENCE, AND CHAIRMAN, THERMO ELECTRON CORP., ACCOMPANIED BY JOHN M. ALBERTINE, PRESIDENT, AMERICAN BUSINESS CONFERENCE

Mr. HATSOPOULOS. Senator Kennedy, Congressman Wylie, I'm honored to be given the opportunity this morning to present to you the results of a study a number of us have been conducting for some time. I might mention that the group consisted of a number of heads of high-tech companies, many of whom are from Massachusetts, as well as the contributions of many members of the American Business Conference—Mr. Albertine, of course, and Mr. Arthur Levitt. We had, in the group, some economists from the Massachusetts Institute of Technology; we had scientists and engineers; and the purpose of putting together that inhomogeneous group of people was to look at the problems from all aspects.

I would like to report to you, first, a summary of the highlights of our findings, and maybe, during the question period, elaborate more on the reasons why we reached those conclusions.

Defining the cost of capital is a difficult job. Usually, what it means to the layman is the interest rates. But, in fact, interest rates play only a part in the picture, and probably not the major part. There are many other factors that define the cost of capital, the most important one being the stock market. There are also tax codes that enter into it, tax benefits, and depreciation rates, as well as the rate of inflation.

Our analyses took all of these into account, to come up with a measure of the overall cost of capital. We call that the real cost of capital services, and this is what I am about to report to you.

We studied the whole postwar period up until last year, but we concentrated most of our study in the period of 1961 to 1981.

Having defined and determined empirically what the aggregate cost of capital services were in each one of those 22 years, we then compared this cost to other quantities. It is through these comparisons that you can draw conclusions as to the effect that the cost of capital has on the economy of the United States.

I am not going to give you details of those comparisons—to start with at least. They compare the cost of capital to the cost of labor, to the returns received by companies, and to the cost of capital in other countries.

I only want to show, in my opening statement, a chart which is probably surprising to all. We all knew that the cost of capital in

Japan was lower than that in the United States, but we never realized the extent of that difference.

This chart shows that the aggregate cost of capital in the United States was between 14 and 15 percent in the 1960's. It jumped up to between 18 and 20 percent in the late 1970's. We see that Japan's cost of capital was more than a factor of 2 lower in the 1960's, but it became more than a factor of 3, lower than that in the United States during the 1970's.

This, among the many other findings, prompted us to reach certain conclusions which are explained in detail in the bulk of the prepared statement. I'll be very happy to elaborate for you after my statement. Our main conclusions are the following:

The high cost of capital in the United States has caused a slowdown of the growth in productivity in the 1970's and, very importantly, has limited greatly the ability of our basic industries to compete with foreign industries. By basic industries, we mean steel, automobile, and many other industries that compete internationally.

The high cost of capital we find has had other detrimental effects. It is one of the important causes that has stimulated inflation in the 1970's. And because of it, of course, it has made it necessary for the current recession to occur.

In addition, at the present time, the majority of the companies in the United States face such high cost of capital compared to returns that, for many of them, the only economically viable investments for their funds is to acquire other companies.

That condition is a very distressing one, because companies acquiring each other do not contribute to job creation or to the economic wealth of the United States.

The combination of all these things has greatly reduced the ability of the economy to create new jobs, and we believe it is the major contributor to the high structural unemployment that we face prospectively in the 1980's.

Senator Kennedy, you mentioned the high technology industries a moment ago. We studied that as well, and we found some very surprising results.

At first, we, like everybody else, felt that the cost of capital affects mostly the industries that are heavy users of fixed capital; that is, the basic industries. It didn't occur to us in the beginning of our study that the high cost of capital can affect high-tech industries as well.

But our analysis showed that the high cost of capital can potentially have an even greater effect on high-tech industries than it does on our basic ones.

To explain this and the major threat the high-tech industries face in the future, I would like to point out that under the present cost differential between the United States and Japan, a Japanese firm can afford to invest five times as much as its American counterpart on any given long-term R&D project. In fact, the longer the term of the R&D project, the bigger will be the multiplier that occurs.

Now, let me point out that in addition to that advantage, there are enormous additional subsidies provided by the Japanese Government and the administrative committee to high technology companies. We saw that from the overall study, and we've seen it through specific examples, where friends of mine in Massachusetts are amazed to find

that their direct counterparts are spending three and four times more for R&D in high technology than we spend in our companies. By the way, some of these Massachusetts companies are the leaders of high technology in the United States.

These conclusions, briefly summarized, lead us to believe that there are only three ways that things can proceed in the future.

First of all, we can leave things as they are, proceeding with business as usual. We could define then what would be the expected equilibrium in international trade that would be resulting from this state of affairs. It may take 10 or 15 years for that equilibrium to be reached, but we ought to see what that may be. It is not a very attractive prospect. It shows that the United States is heading toward a condition where it would be a producer of food and raw materials but, would be a second-rate industrial power.

The second possibility, which I personally believe is more likely to happen than the first, is that by the end of the decade the pressures for trade barriers would become so enormous in order to salvage jobs in this country that we would get to a condition highly undesirable for us and the world as a whole, where we isolate the United States economically from the rest of the world.

The third possibility, which I hope will take place, is that within the next 2 or 3 years, we could find ways to produce a major reduction in the cost of capital, and do this in parallel—and I stress the word "parallel"—with measures designed to increase savings, so as to be able to fund the investments both in R&D and fixed assets that would result from reduced cost of capital. This condition could bring back our basic industries to some degree—some of them, maybe not all of them. But even more importantly, it would safeguard the future of our high technology industries.

The purpose of the study was not to find solutions, but rather to define the problem—one that was known for some time by members of this committee. I've been reading for years the reports of this committee to Congress, and I think that its members have been fully aware—even back in 1977, 1978, 1979, and 1980—that this was a basic problem.

What I think we have contributed with our study is a measure of the magnitude of the problem that was not recognized. It is enormously greater than what we have assumed, and it spells catastrophe for many of our industries and for our ability to create jobs.

There is no single action either by the administration or Congress that can really accomplish a major reduction of the cost of capital necessary to reverse this unhappy trend.

We believe that only a coordinated combination of actions can do it. These actions fall in two major categories: First, macroeconomic policy that really deals with a balance of fiscal and monetary policies that can, on the one hand, maintain a lower inflation condition, as well as prevent very high budget deficits that can eat up the available funds for investment.

Senator KENNEDY. Mr. Hatsopoulos, I regret that I am going to have to excuse myself. I have a press conference with some Members over at the Senate at half past 10.

I want to thank you again very much for this statement, and let me give you the assurance that I'll look forward to working closely

with you as we try to develop some alternative economic policies for the future.

I think you have made some very good recommendations here and identified the problems, and I will look forward to working with you.

Representative WYLIE [presiding]. Will you please proceed with your statement.

Mr. HATSOPOULOS. Well, I have only two more sentences to add.

The second class of action would involve bold new tax policies, but I want to point out that even some minor procedural changes within Federal agencies, such as the Securities and Exchange Commission and the IRS, could contribute to a solution with very little cost to the Government.

But finally, an education of both the leaders of this country, the business community, as well as the public we feel is essential to finding ways to solve the problem.

Thank you very much.

[The prepared statement of Mr. Hatsopoulos follows:]

Prepared Statement of George N. Hatsopoulos

Handicap of American Industry

This study examines the marginal cost of capital to U.S. corporations from 1961 to 1981 and its effects on the factors that influence economic growth, labor productivity, the development of growth industries, and competition with Japan. The study addresses all U.S. nonfarm, nonfinancial corporations which account for about 80 percent of total output in the nonresidential business sector.

The Cost of Employing Capital

Businesses obtain their funds from equity and debt and invest them in fixed assets and working capital. The cost of such investment funds in the U.S. is much higher than the prevailing interest rates on corporate bonds because equity is more than twice as costly and three times as large in extent as debt. For example, the interest rate on long-term bonds was only 4 percent in 1961, while the pretax cost of equity was 15 percent. By 1981, the cost of equity had risen from 15 percent to 35 percent.

The reason that U.S. firms rely upon equity rather than less costly debt is the need to reduce risk to a level considered prudent by both corporate managers and lenders--equity does not involve the strict obligation for repayment that is attached to debt. Accordingly, the cost of equity rather than that of debt is the principal determinant of the cost of funds.

The cost of business investments, which we shall call the cost of capital services, depends not only on the cost of funds but also on the benefits of increases in asset values due to inflation, the benefits of tax credits and depreciation allowances, and the cost of asset decay or actual depreciation. Between 1961 and 1973, the real cost of capital services, i.e., the cost adjusted for inflation, was practically constant at about 15 percent (see Fig. 1). After 1973, it rose sharply to over 20 percent, and has remained at about this level ever since.

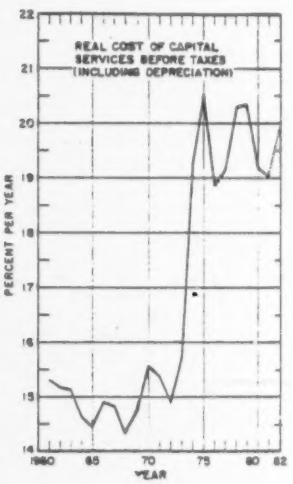

Figure 1. Real Cost of Capital Services for U.S. Nonfinancial Corporations

Balancing Capital and Labor Costs

The ratio of the nominal cost of capital services (pretax) to the nominal cost of labor determines the optimum allocation of these two factors of production. Increases in this ratio lead to a decline in the amount of capital used by the business sector. This, in turn, reduces labor productivity and lowers the level of real wages. Since 1973, the cost of capital services has increased relative to the cost of labor by more than 20 percent. This adverse trend--capital

increasing in cost at a rate faster than labor--is in sharp contrast to the record of the 1960's when the ratio declined by 27 percent as labor costs rose while the cost of capital remained stable.

A Growing Gap in Capital Formation

The high cost of capital in the U.S. has dampened investments in labor-saving equipment needed to boost productivity and reduce inflationary cost pressures. Figure 2 shows the value of equipment and structures, measured in constant 1972 dollars, utilized by U.S. business for each hour of potential employment. From 1961 to 1974, this capital to labor ratio was growing at an average rate of 3.3 percent per year. After 1974, the annual growth rate fell to only 1 percent.

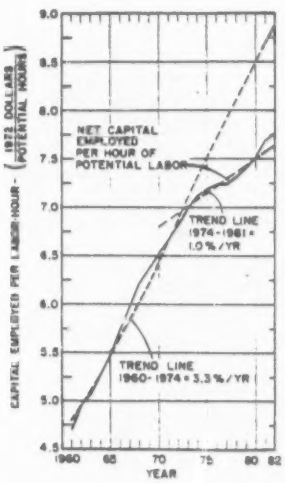

Figure 2. Capital to Labor Factor Ratio for U.S. Private Business Sector.

The present gap between actual and historical capital stocks represents a deficit of over $150 billion. In fact, the shortfall in capital formation directed towards increased labor productivity is even larger than indicated by this figure because of the effects of the energy price increases occurring after 1973. In response to the energy crisis, large amounts of capital were diverted away from labor-saving investments and into investments aimed at either producing energy or improving the efficiency of energy usage.

Neither the restoration of America's basic industries, nor the development of new ones can take place without first effecting a major reduction in the cost of capital. Although the Economic Recovery Tax Act of 1981 had been heralded as a major step forward, this legislation actually had a much smaller impact than generally believed--a drop of only 1.2 percentage points in the total cost of capital services for corporations. In fact, almost all of the gains provided by ACRS were negated by increases in the cost of both debt and equity that occurred in 1981-1982.

Declining Profitability - The Path to Liquidation

There has been no corresponding increase in corporate profitability to compensate for the higher cost of capital. In fact, the actual return on capital divided by the cost of capital services has exhibited a severe downward trend since 1974. This ratio has remained below 80 percent in each of the last eight years, including years of high economic activity such as 1979. The erosion in profitability relative to costs has undoubtedly weakened capital formation, and contributed to slow economic growth. Dramatic evidence of the decline in America's productive sector can also be seen from the drop in the aggregate market value of corporate equities--from 120 percent of net worth in 1968 to 50 percent in 1981 (see Fig. 3).

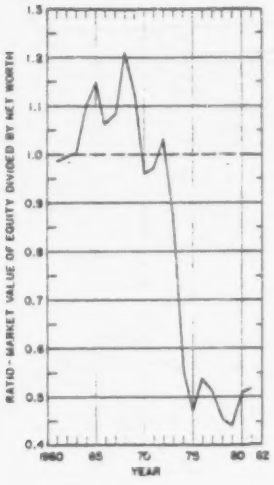

Figure 3. The Declining Market Value of Corporate Equities - U.S. Nonfinancial Corporations.

In light of the collapse in equity values that has occurred since 1973, it is not surprising that we have seen a dramatic rise in take-overs and acquisitions. Many individual companies have fallen well below the average market value shown in Figure 3. Thus, although profitability is low in terms of replacement cost--returns equal to 70 or 80 percent of the cost of capital services--the severe depression of selected equity values affords opportunities for profitable acquisitions. These, however, do not contribute to economic growth.

There are, of course, still investment opportunities whose returns are higher than the cost of capital services, and such investments will continue to be made. Nevertheless, the higher the cost of capital services, the more limited is the spectrum of profitable investments available to corporations.

Foreign Competition - The Challenge to American Industry

One of the most serious problems confronting key sectors of U.S. industry is the rising level of international competition, particularly from Japan. Domestic manufacturers of steel, automobiles, consumer electronic products, and even high technology goods such as microprocessors, are losing their markets to Japanese competitors. A principal cause of this problem is the enormously higher cost of capital in the U.S. relative to Japan.

In Japan, corporations routinely incur much greater proportions of debt compared to U.S. firms, especially during periods of rapid expansion. In fact, the debt leverage in Japan often exceeds 4 or 5 to 1, and in some cases can reach 10 to 1, versus only 1 to 3 in the U.S.

This financing behavior is the result of major structural differences between the Japanese and U.S. economies. Japanese banks provide a special impetus to selected industries that are targeted for growth by government planners. Free market forces are substantially curtailed, venture capital is almost nonexistent, and investors' influence on corporate decisions is nil.

Although these features of the Japaneses system undoubtedly cause a loss of efficiency and flexibility in capital deployment, there are significant advantages accruing to specific target industries. By effectively eliminating any constraints on leverage, incremental funds are provided to fast growing companies at very low cost during the crucial time when long-term speculative investments must be made. As industries mature and their growth rates subside, retained earnings are used to retire the loans accumulated during the growth phase.

The curves in Figure 4 make readily apparent the enormous cost advantage enjoyed by Japanese companies relative to their U.S. competitors. Even before 1973, the real cost of capital services in the U.S. was double that in Japan. After 1973, the cost of capital fell to almost zero in Japan, but U.S. costs rose still further in response to worldwide inflationary trends stemming from the first "oil shock."

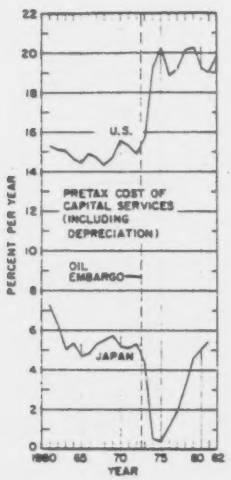

Figure 4. Cost of Capital Services in the U.S. and Japan.

Today U.S. businesses face an almost insurmountable barrier--a cost of capital more than three times that of their Japanese competitors. The much lower cost of capital services in Japan is consistent with the rate of gross capital formation as a fraction of GNP, which for Japan is more than double that found in the U.S.

High U.S. labor costs are frequently cited as a principal reason for the inability of U.S. industry to compete in world markets. Though labor costs are important, far too little attention has been paid to the cost of capital--a key determinant of the nation's ability to invest in new technology and improved productivity.

Lower cost of capital, combined with lower labor costs, gives Japan a decisive advantage, not only in existing basic industries, but in the development of new high technology industries as well. The importance of the cost of capital can be seen in the comparison of U.S. and Japanese cost structures. In 1981, a typical product involving $10,000 worth of labor and capital cost in the U.S. would involve only $4,900 in Japan. Lower marginal cost of capital accounts for 45 percent of the total $5,100 savings in Japan--about $2,300. The remaining $2,800 cost advantage is due to the much publicized labor rate differential between Japan and the U.S.

Industrially advanced countries cannot compete on the basis of labor costs. Rather, they must rely upon technology and capital investment to establish not only lower costs, but superior product quality and performance as well.

The Threat to High Technology Industries

High cost of capital is particularly damaging to the development of U.S. high technology companies. A common characteristic of such companies is innovation, which invariably involves risk and requires the commitment of investment over long periods of time. Often, the greater the rewards for successful development, the greater will be the risk, and the longer the time before returns are realized. For example, the introduction of integrated circuits to the market was preceded by many years of research and development during which the possibility of failure was very high.

It is worthwhile for a company to pursue a new idea or a new investment only if the present value of expected future financial rewards will exceed the discounted value of all expenditures. Consider, for example, a new venture requiring 5 years of development and having the same estimated probability of success in the U.S. as in Japan. Such a project could justify only 40 percent as much private R&D investment in the U.S. today as in Japan, due to the enormous disparity in cost of capital. For longer term projects, e.g., a 10 year development cycle, the disadvantage to U.S. businesses is even larger. Japanese researchers can invest 5 times as much in R&D as their U.S. competitors in this type of venture, assuming the same eventual return.

Given the huge disadvantage in cost of capital, it should come as no surprise that U.S. managers must focus on short term payoffs, while the Japanese are lauded for their patience and vision in pursuing long term goals. The fact that the U.S. now leads the world in several high technology industries provides little grounds for comfort. Many of these technologies were developed at a time when the economic environment in the U.S. was more favorable and that in other countries was much worse.

It is not necessary that the cost of capital in the U.S. be the lowest of any other country because the U.S. has many other advantages. These include a highly efficient free market system for the deployment of capital, an abundance of most raw materials, and a well developed business infrastructure that can offset small disadvantages in the cost of capital.

If the U.S. is to maintain its lead in high technology, we must either lower our cost of capital or provide massive federal subsidies for new ventures--a course that is likely to be far less efficient than our free market system for allocating development funds. If, on the other hand, the present situation is allowed to persist for another 10 years, America's high technology industries may meet the same fate as its smoke-stack industries.

Restoring America's Competitive Edge

A major reduction in the cost of capital is required to reverse the deteriorating position of U.S. industry in world markets and to provide the economic climate necessary for sustaining economic growth. Two important tools for accomplishing this change are macroeconomic policy and tax legislation.

Macroeconomic policy plays an important role because the inflation rate and prospective government deficits have both direct and indirect effects on the cost of capital. During the late 1960's, for example, the U.S. inflation rate was 4 percent, the real costs of debt and equity were 2.8 percent and 6 percent, respectively, and the real cost of capital services was just under 15 percent. If we could restore this same environment (i.e, inflation rate, real interest rate, and equity risk premium), the real cost of capital services would drop from 19 percent to 13.5 percent. This would be about 1.2 percentage points below the cost prevailing in the late 1960's due to tax reforms implemented over the past decade.

Tax policy is the most effective tool available for reducing cost of capital. To illustrate this, two hypothetical changes in tax law were examined. A reduction of the federal corporate tax rate to zero, all other conditions remaining constant, would reduce the 1981 cost of capital to 15.2 percent, 3.5 percentage points below its actual value.

A more effective--and for the government, less expensive--approach is reclassification of the tax status of corporate financial instruments to permit increased use of tax-favored sources of financing. For example, if dividends paid on cumulative preferred stock were treated as tax deductible interest payments, corporations could issue such stock in lieu of conventional debt. This type of stock affords much lower risk of insolvency than a bond because the payment of the dividend can be deferred. The yield on such a preferred stock will, of course, have to be greater than that on bonds--probably as large as the after-tax yield on equity. Since it will be tax

deductible to the corporation, however, it reduces the cost of capital to profitable firms by 9 percentage points--18.8 percent to 9.8 percent in 1981. Such a reduction would cut the previously noted Japan-U.S. cost advantage on a typical $10,000 product from $2,300 to $700. The interaction between inflation and the corporate tax code makes the reduction in cost of capital for this change in the tax law much larger than that obtained by simply eliminating corporate taxes.

Measures aimed at reducing the marginal rather than the average cost of capital are attractive not only because they benefit selectively those industries with the highest rate of investment for modernization and growth, but also because such policies are far more cost effective. For example, the lowering of corporate taxes only at the margin provides the maximum stimulus to growth for the minimum loss in overall tax revenues. A number of previously enacted tax measures, such as the investment tax credit and certain provisions of the Economic Recovery Act of 1981, were targeted in this way.

The measures cited above do not constitute specific policy recommendations because no isolated action can create by itself the economic environment in which the cost of capital will be reduced. Moreover, any actions taken to lower the cost of capital must proceed in tandem with measures designed to increase savings.

A program for reducing the cost of capital must start with a broad recognition of the magnitude of the problem and its impact on the well being of the American people. Once this happens, the design of a practical solution acceptable to the broadest cross section of our society will be only a matter of time.

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Teradyne, Inc.
Dimitri V. d'Arbeloff, Chairman and Chief Executive Officer,
Millipore Corporation
Elias P. Gyftopoulos, Ford Professor of Engineering
Massachusetts Institute of Technology
James M. Poterba, Instructor in Economics
Massachusetts Institute of Technology
Roger D. Wellington, Chairman and Chief Executive Officer,
Augat Inc.
Thomas F. Widmer, Vice President, Engineering
Thermo Electron Corporation

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Representative WYLIE. Thank you very much, Mr. Hatsopoulos. And it is unfortunate there aren't more members here to hear your excellent statement and to participate in this question-and-answer period this morning.

I'll try to get into some of the questions which I think that some of the others might have on their mind—but are not, certainly, on my mind—to try to make a good record of the proceeding here this morning and, in my own way, to allow you to put your best foot forward, which I know is a good one.

Well, to follow up on that, we have been told that the cost of Japanese capital is about three times the cost of American capital, but are not the barriers presented by the Japanese the major trade problems between the two countries?

For example, in your prepared statement, you state that loans at low interest rates are provided to Japanese businesses by formal national policy. In effect, therefore, our private markets are competing with the Japanese Government.

Aren't the cards stacked against us in an atmosphere like that?

Mr. HATSOPOULOS. I am surprised how much the cards are stacked against us in every respect. I don't see why they need the trade barriers that they have been holding on to. They already have such an advantage in the cost of capital that they could do away with some of the trade barriers, and probably they will as they get more and more comfortable, but they have us over a barrel by the cost of capital.

Representative WYLIE. Well, you speak of the threat in your statement, and in answer to the question, Do the American economists oppose the move by the active competition of the Japanese? Many prominent individuals, including the leading candidate for President in the Democratic Party right now, have called for very protectionist measures against the Japanese.

What would be your reaction to that? What would be the effect on our economy if we did enter into some sort of protectionism?

Mr. HATSOPOULOS. I feel that protectionism is going to be a remedy that would have very bad consequences, and if it starts, it will have to escalate to its logical conclusion of complete isolation.

It would deprive the world of the free exchange of goods that will give it the best productivity. It will cause problems of a geopolitical nature. I think that this is not a good solution to the problem, but it might be—unless we act now on the cost of capital, it may become the only solution. That is what I am afraid of.

We feel that we should create an environment in America where—within our free economic system—companies can produce and compete, and if some of them cannot compete with Japan under equal terms, so be it. Others will compete, but if the environment is so lopsided, stacked against the American industry, there is no way that we can maintain our free economy and a free world economy.

I believe that we can compete, for instance, if we were to come anywhere close to the cost of capital that they have in Japan—probably not even equal to it, but maybe 50 percent higher instead of 300 percent higher. Right now, for instance, if we were to drop the cost of capital in the United States to 9 percent, we looked at what U.S. Steel could do. It could essentially double the rate of investment they made for the same cost to them, and a doubling like this of rate of investment

may give them a good chance of getting to a position in a few years where they can compete, even though the labor costs are much higher here than in Japan.

Maybe they won't make it, but others will make it. Maybe the automobile companies will make it, and certainly we will help our high-tech industry, which I feel now is in the same phase of potential problems that our basic industries were some years ago.

In other words, the cards were stacked so that our basic industries had to get into trouble with this differential. Now, high-tech industries, if that differential persists, will get into trouble. I don't know if it is going to take 5 years, 10 years, or 15 years. That I can't tell.

Representative WYLIE. Well, the cost of capital here is three times what it is in Japan.

The principal source of funds in Japan, as you said, is debt.

Mr. HATSOPOULOS. Exactly.

Representative WYLIE. Is 5 to 1 based on equity?

Mr. HATSOPOULOS. Right.

Representative WYLIE. And 3 to 1 in favor of equity in the United States.

What is the significance of so much debt to equity? Do the companies issue bonds that are——

Mr. HATSOPOULOS. Yes. Well, they issue—surprisingly, they don't use, don't seem to use, that many long-term instruments. They have very large short-term borrowings.

The companies go to the bank. Every group, loosely knit group, of companies has a lead bank. They go to the bank and borrow some of the funds, and then they go to other banks and they borrow funds, and then they go to government banks, industrial banks, that are really financed by the government and get funds.

So they get funds usually on short term. That gives them—the short term gives them the advantage—in spite of the policy, I believe it gives them the advantage to adjust according to the needs of the capital markets and the needs of the country; whereas, long term, you are committed to fixed rates.

So most of the financing is short-term financing in Japan, and it is enormous.

Representative WYLIE. On your previous chart, if I could for just a moment, you showed that the changes in depreciation that we made in 1981 had very small effect on the capital costs, on our capital costs.

Is there any special reason for that?

Mr. HATSOPOULOS. Well, first of all, most of these changes—all of these changes were made in 1981—prospectively were much larger. Now if you recall, in 1981, you provided for immediate implementation of 10–5–3 at 150-percent declining balance, to be increased in 1985 to 175-percent declining balance, and in 1986 to 200-percent declining balance.

Each one of those steps had equal effects. In other words, if the full ACRS program was implemented, you will get three times as much.

If you remember, TEFRA cut down the process and left only what was implemented in 1981, and even that was reduced somewhat.

The second reason why the effect is small is that fixed assets, equipment, as a fraction of capital in the U.S. corporation is only 30 per-

cent. A big bulk is inventory. In fact, high-tech companies have more inventory fraction than basic industries.

The result is that the numbers I give you, which are average, are really actually worse for high-tech industries. That is because high-tech industries have a greater fraction of inventories, and inventories have not been given any tax relief. For inventories, the actual "cost-of-capital" curve for high-tech industries is a little higher than that shown in our chart. So we see that the makeup or composition of capital has an effect. Most of the tax changes—ITC, ACRS—not the income tax rate but just these two, have applied only to the equipment part of the capital, which is only one-third of the total.

Senator BENTSEN. Let me ask you then, Mr. Hatsopoulos, if I may, when you get a multiple of 20 or 25 to 1 on a price-earnings multiple for high tech, why doesn't that afford you some fairly cheap capital?

You are talking about a low stock market, but for the high-tech industry, we have seen good growth.

Mr. HATSOPOULOS. Senator, this is a very interesting question, and we have an answer for it. We looked at the segment of industry that has high multiples. The cost of capital—and we are dealing with the cost of equity here—contains two terms.

One is the pricing of the stock relative to the current earning, in other words, the "multiple," and the second term is the prospective growth rate of these earnings.

Now, if you look at the record, you find, if anything, the multiples of 20 to 1—well, say an 18 to 1 multiple for Hewlett-Packard yields a greater cost of equity than a 5 to 1 multiple for U.S. Steel because of the growth. Whereas, in basic industries, the growth rate has been at the most 1 or 2 percent, high-tech companies have had real growth rates of 8 percent.

Now, if you combine these two, you find that, if anything, high-tech companies have had even higher costs.

Representative WYLIE. We are joined by Congressman Jim Scheuer of New York.

Congressman, do you have any questions?

Representative SCHEUER. Well, just a couple of minor questions.

I visited the Yamasaki Machine Tool Works in Japan and met with Mr. Yamasaki's son, who, incidentally, is here in the States at the present time, and he told me that when they first went into robotics, they were financed by the consortium of banks, and they lost money for over 10 years and the banks never batted an eyelash. They didn't give a damn.

The first year they made a little, the second year they made a little more, and the third year they were rolling in it, and everything has been blue skies for them ever since.

That conflicts with your statement that in Japan, financing is short term. As I understand it, one of the real advantages the Japanese have—the Japanese entrepreneurs have—is that they can get long-term financing and they don't have to show a profit in the first quarter or the quarter after that or even the next year.

They can really look for the long pull, and the financing is based on that; whereas, in our country, we are all fighting to show a favorable report in next year's annual report and to make a favorable

address to the society of investment analysts, the Wall Street Luncheon Club, next week for the third quarter of this year.

Mr. HATSOPOULOS. Right.

Representative SCHEUER. My understanding is that Japanese business has had advantages, especially the high-tech business, in that the banking community did not expect them to show short-term profits and that they did get financing for the long pull.

Mr. HATSOPOULOS. The conception of both banks and industry that receive the loans is that these funds are in fact longer term, very long-term financing. They do it on a short-term basis and adjust the rates instead of issuing bonds, but they behave as though it was very long-term financing. In effect, it is very long-term financing, so you are absolutely right.

It is the mechanics of the thing—they take loans that appear to be shorter term, but everybody knows they are long-term commitments.

Now, we face that same thing in this country. Our company has a very valuable relationship established over 20 years with the First National Bank of Boston. When we borrow money on a shorter term we know it's really long term, because they are committed.

Representative SCHEUER. They just roll it over.

Mr. HATSOPOULOS. They roll it over, that's all.

Representative SCHEUER. Another question. On inventory, you say the Japanese have a larger inventory. I have read recently that——

Mr. HATSOPOULOS. They have a lower—I am sorry. They don't have a larger inventory.

Representative SCHEUER. I think you said "larger."

Mr. HATSOPOULOS. I said high-tech industries have——

Representative SCHEUER. It is my understanding that high-tech industries have a lower inventory. And their automobile manufacturing—I don't suppose you call that high tech—they actually have the various parts delivered the same day that they are going to be used—in fact, within a few hours of their scheduled use.

They contract with the subcontractors to deliver the stuff on demand almost on an hourly basis.

Mr. HATSOPOULOS. Yes, sir.

Representative SCHEUER. So, they don't have to store inventory at all. It is virtually delivered to the production line.

Mr. HATSOPOULOS. I'm fully aware, Congressman, of that, and you are absolutely right. In Japan, they have been able to handle their inventory exceedingly well in any one industry.

Compare Japan to the United States. They have lower inventories and that, of course, helps them quite a bit.

That is a skill that I think we should emulate, and I don't understand why we can't do the same.

However, I was referring to comparison between high tech in this country—let's say Digital Equipment and basic industry in this country, like Bethlehem Steel. We looked at the numbers, and Bethlehem Steel has only 20 percent of the capital as inventory, whereas Digital Equipment is 40 percent of their capital. And that is all I was referring to.

Compared with Japan, each of them has higher inventories in this country than in Japan. That is another plus for Japan. That is a man-

agement advantage. I don't know how they do it, but apparently they have developed that skill.

Representative WYLIE. Mr. Hatsopoulos, the buzzers signify that we are now in a vote situation on the House floor. You have been an excellent witness. Thank you very much for very fascinating and most worthwhile testimony. I am privileged to have been the chairman of the meeting this morning, along with Senator Kennedy.

But now I'm going to turn the gavel over to Senator Bentsen to conclude the hearing, and I think he has some brief questions.

Senator BENTSEN [presiding]. Thank you very much.

I would like to say that we have another man at the table there that was executive director of the Joint Economic Committee at a time when we established the consensus on productivity and capital investment that developed later into a national consensus. He was a man who was able to work with the various philosophies within the committee, its staff, and its members and bring about a consensus. He was very effective at it.

I had the pleasure of being chairman at the time he headed up the staff. He is a man of incredible energy, and had a very distinguished career in academics as well. Since then, he has joined the private sector in industry and has become a key spokesman for some of the growth industries of America. In fact, I can't really make up my mind whether Lee Iacocca or Jack Albertine gets more press. [Laughter.]

In fact, I've watched with great interest as his name identification has soared, and I am delighted that he does not hold residence in Texas so that he might not choose to run for the Senate from Texas. [Laughter.]

Jack, I want to express my strong appreciation for the work that you have done. We have waited 2 years to award this plaque to you because we wanted to see some of the policies we developed finally begin to work. [Laughter.]

Mr. Albertine, if you would come forward, I would like to give you this plaque. You can't deposit it in the bank, and it won't put any food on your table, but it should make you feel good to look at it, and it expresses my sincere appreciation for your striking contributions to economic policy while at the Joint Economic Committee.

Jack, congratulations.

Mr. ALBERTINE. Thank you very much.

Senator BENTSEN. As you can tell, Doctor, we had fun while we were doing it.

Thank you so much. The committee will now stand adjourned.

[Whereupon, at 11:12 a.m., the committee adjourned, subject to the call of the Chair.]

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